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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FICK, ANTHONY D

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/815,346

Applicant(s)

SIBBETT ET AL.

Examiner

Anthony Fick

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-20 and 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-24 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Remarks

1. Applicant's amendments to the drawings and specification have overcome the objections made in the previous office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1 through 6, 10 through 20, 22, 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claims 1, 10 and 14 recite the limitation "separating the fluid passage and the second fluid passage". It is unclear which passage is referred to in the first mention of a fluid passage. Applicant can overcome this ambiguity by amending the claim to read "separating the first fluid passage and the second fluid passage".
5. Claims 2 through 6, 11 through 13, 15 through 20 and 22 through 24 all depend from one of these claims and are indefinite for the same reasoning.
6. Claim 10 recites the limitation "the first fluid passage" in line 11. There is insufficient antecedent basis for this limitation in the claim. The claim further recites the limitation "the second fluid passage" in line 11. There is also insufficient antecedent basis for this limitation in the claim.
7. Claims 11 through 13 and 23 all depend from claim 10 and are indefinite for the same reasoning.

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8. Claim 14 recites the limitation "the first fluid passage" in line 12. There is insufficient antecedent basis for this limitation in the claim. The claim further recites the limitation "the second fluid passage" in line 12. There is also insufficient antecedent basis for this limitation in the claim.

9. Claims 15 through 20 and 24 all depend from claim 14 and are indefinite for the same reasoning.

10. Claim 24 recites the limitation "A microfluidic device of claim 14" in line 1. There is insufficient antecedent basis for this limitation in the claim as claim 14 is a multi-step separation device not a microfluidic device.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 2, 5, 6, 10, 11, 14 through 17 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Jacobson et al. (U.S. 6,685,809).

Jacobson discloses a microfluidic device as shown in figures 1, 1A and 1B.

Regarding claim 1, the device comprises a body having a first fluid passage, 20A and 20B or analysis channel, a second fluid passage, 25A and 25B or side channel, a first electrode positioned in the first fluid passage, either 40 or 50, and a second

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electrode positioned in the second fluid passage, either 55 or 60. Figure 1A further shows a membrane, 65, positioned separating the first fluid passage from the second and in communication with both passages. It is the position of the examiner that the fluid passages share common points through the membrane, and thus intersect each other the same way applicant's passages intersect as seen in applicant's figure 2.

Therefore the device of Jacobson meets all the structural requirements of the claim.

Regarding claims 5 and 6, the electrodes in figure 1B are placed within the reservoirs of figure 1 (column 5, paragraph 7) thus each passage contains at least one reservoir with the electrode positioned in the reservoir.

Regarding claim 2, Jacobson further discloses making the body out of PDMS (column 11, paragraph 2) and the use of polyacrylamide gel for the membrane (column 10, paragraph 2).

Regarding claim 10, Jacobson also shows a cover plate, 15, in figure 1B covering the channel and the membrane. The channel in figure 1B separates two first reservoirs, 40 and 50, and a first electrode positioned in the channel, within the reservoirs. The device also contains a membrane, 65, in communication with the channel and a second reservoir, 55, through the blank in fluidic contact with the membrane. The second reservoir is in communication with the channel via the membrane and has a second electrode positioned within the reservoir. As there is only one channel required by claim 10, the new limitation of two passages intersecting at the membrane does not add new structure to the previous claim. Also as stated above, the examiner's position is that Jacobson does show intersection of two passages.

Regarding claim 11, Jacobson discloses making the body out of PDMS (column 10, paragraph 2).

Regarding claim 14, the disclosure of Jacobson shows in figure 1B two electrodes within the channel, one being within the reservoir. The two electrodes can maintain a voltage in the channel as shown by the power supply in figure 1B. As there is only one channel required by claim 14, the new limitation of two passages intersecting at the membrane does not add new structure to the previous claim. Also as stated above, the examiner's position is that Jacobson does show intersection of two passages.

Regarding claim 15, the electrode on the right of figure 1B is proximate the membrane as shown in the figure.

Regarding claim 16, the electrodes are connected to a power supply and are enabled to apply a voltage gradient to a solution disposed in the channel (column 6, paragraph 1) to cause migration of charged particles.

Regarding claim 17, Jacobson discloses use of PDMS (column 10, paragraph 2).

Regarding claim 20, the membrane disclosed by Jacobson, the polyacrylamide gel (column 10, paragraph 2) is a sieving media.

13. Claims 1 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Bohn et al. (U.S.P.G.Pub 2003/0136679).

Bohn discloses a microfluidic device as shown in figures 1 and 4.

Regarding claim 1, Bohn shows in figure 1 a body comprising a first fluid passage, 30, a second fluid passage, 28, and a membrane positioned separating the

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passages and in communication with the passages, 22. Bohn further discloses placing electrodes within the passages to create voltages (figures 4 through 6) and pass electrons from the first passage to the second passage through the membrane. Figure 1 further shows the fluid passages intersecting where the membrane is positioned separating the fluid passages.

Regarding claim 22, figure 1 shows a three level structure with the first passage and second passage separated by the membrane.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 3, 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson as applied to claims 1, 2, 5, 6, 10, 11, 14 through 17 and 20 above, and further in view of Ruiz-Martinez et al. (U.S. 6,554,985).

The disclosure of Jacobson is as stated above for claims 1, 2, 5, 6, 10, 11, 14 through 17 and 20.

The difference between Jacobson and claims 3, 12 and 18 is the requirement of an agarose gel membrane.

Ruiz-Martinez teaches a method for separation of biological molecules. The separation medium is a sieving matrix of polyacrylamide, polymer solutions, or agarose (column 1, paragraph 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the agarose of Ruiz-Martinez as the membrane of the device of Jacobson because agarose and polyacrylamide are functional equivalents for use as sieving medium (Ruiz-Martinez column 1, paragraph 3). Because Jacobson and Ruiz-Martinez are both concerned with material manipulations, one would have a reasonable expectation of success from the combination. Thus the combination meets claims 3, 12 and 18.

16. Claims 4, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson as applied to claims 1, 2, 5, 6, 10, 11, 14 through 17 and 20 above, and further in view of Olivares et al. (U.S. 6,942,773).

The disclosure of Jacobson is as stated above for claims 1, 2, 5, 6, 10, 11, 14 through 17 and 20.

The difference between Jacobson and claims 4, 13, and 19 is the requirement of a membrane made of cellulose.

Olivares teaches a separation device to detect particles. The separation channel utilizes a sieving medium such as polyethylene glycol, polyacrylamide, hydroxyl propyl methyl cellulose or hydroxyethylcellulose (column 2, paragraph 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the cellulose of Olivares as the membrane of the device of Jacobson because cellulose and polyacrylamide are functional equivalents for use as sieving medium (Olivares column 2, paragraph 7). Because Olivares and Jacobson are

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both concerned with material manipulations, one would have a reasonable expectation of success from the combination. Thus the combination meets claims 4, 13 and 19.

Response to Arguments

17. Applicant's arguments filed September 5, 2006 have been fully considered but they are not persuasive. Applicant argues that Jacobson fails to disclose or suggest the first and second passages intersecting where the membrane is positioned. The examiner respectfully disagrees. As stated above, it is the position of the examiner that the fluid passages share common points through the membrane, and thus intersect each other the same way applicant's passages intersect as seen in applicant's figure 2. A cross sectional picture of Jacobson's device would produce the same figure as applicant's figure 2. Therefore the device of Jacobson has the same structure as applicant's device where the membrane is positioned separating the fluid passages and the passages of Jacobson meet applicant's definition of intersect. As to these added limitations within claims 10 and 14, there is only one channel required by the claims, and the new limitation of two passages intersecting at the membrane does not add new structure to the previous claim unless the applicant is now placing multiple passages within each of claims 10 and 14. Applicant's arguments in regards to claim 1 are also moot in view of the new grounds rejection stated above.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday thru Friday 7 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick *AF*
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November 8, 2006


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